43, there is no mention of *Actias rossi*. Neither is it mentioned in the "synopsis" on page 78, where only *luna* is listed.

Another variety of *Tropæa luna*, is Walker's *dictynna*, Cat. Lep. Het. Brit. Mus. VI, 1264. The description is as follows: "Yellowish green. Head and fore part of the thorax whitish. Thorax with a broad purple band in front. Wings with an exterior slender incomplete pale brown band, which is most incomplete on the hind wings. Fore wings with a purple costal stripe, from whence a short branch proceeds to the vitreous ocellus; the latter is transversely elliptical and is bordered with brown, tawny, black, blue and black on the inner side, and with lilac, red, luteous and ferruginous on the outer side. Hind wings with a round ocellus, larger than that of the fore wings, but with the like disposition of colours; tails rather shorter than the breadth of the hind wings. Length of the body 12 lines; of the wings 52 lines.

"This species much resembles *T. luna*, but may be distinguished by the band on the wings, by the not empurpled exterior border, by the fore wings, which have a less oblique and more straight exterior border, and by the hind wings, which have shorter tails."

Variety *dictynna* is to be found more abundantly in the Southern United States.

ON A SUPERNUMERARY MEDIAN OCELLUS IN MELANOPLUS FEMUR-RUBRUM.

By M. W. Blackman,
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In conducting laboratory work upon invertebrate forms, the teacher often has opportunities for observing interesting abnormalities of various organs both internal and external. These unusual structures are as a general thing very apparently due to injuries followed by a more or less successful attempt at repair or regeneration. Occasionally, however, anamolies occur which seem hardly to fit in with such an explanation and which must be classed as congenital. It is the belief of the writer that such cases should be reported even though no adequate explanation of the reason for the abnormality can be offered.

In insects the ocelli are usually present to the number of three—

two lateral ones, lying more dorsally, and a single median one. This arrangement is subject to considerable variation and even the number is not constant for the entire class. There may be only two present (Lepidoptera, etc.) or only one, and indeed in a number of cases (Dermaptera, Locustidæ, Coleoptera, some Homoptera, and some Lepidoptera), the ocelli may be entirely absent in the adult. So far as the writer knows the ocelli are never more numerous than three except in immature forms, degenerate parasitic forms, and in certain of the very lowest insects in which groups of ocelli take the place of the compound eyes. In the pupal stage of *Bombus* the median ocellus, according to Packard[1] possesses "a double shape, being broad, transversely ovate and not round like the two others, as if resulting from the fusion of what were originally two distinct ocelli." In accordance with this we might expect to find a pair of median ocelli or at least a transversely ovate one in the adult or nymphal stages of lower insects. Such, however, is not the case except possibly in other members of the order Hymenoptera where as will be mentioned later the structure of the nervous connections are such that we might expect occasional double median ocelli in the immature stages and possibly even in the adult.

The normal number of ocelli in the short horned grasshoppers is three, arranged in a triangle, the two dorsal ones being lateral and near the inner margin of the compound eye, while the ventral ocellus is median in position ventral to the antennæ. In a number of years experience with grasshoppers in laboratory work with large classes the writer has never seen any variation in the number or relative position of these ocelli. Last fall, however, an adult female specimen of *Melanoplus femur-rubrum* was brought to me by one of my students which possessed two median ocelli instead of the ordinary single one. As I had never seen or heard of such an anamoly, the specimen was preserved for further study.

The accompanying photograph reproduced at a magnification of about five diameters shows the conditions better than would a lengthy description. The two median ocelli will be plainly seen placed symmetrically one on each side of the median line. Each is approximately circular and apparently perfect in every respect. Each one as far as could be observed is but slightly smaller than

[1]Packard A. S. Text Book of Entomology Macmillan Co., New York (1898).

the single ocellus usually is. The two are entirely distinct, each being set in a slight depression with the intervening distance greater than the diameter of each ocellus. The lateral ocelli, one at the inner upper margin of each compound eye are both present and both normal. Unfortunately, due to lack in depth of focus of the lens used, these do not show in the photograph.

Believing it would be interesting to know the nature of the ocellar nerve and its relation to the brain, the head was removed and

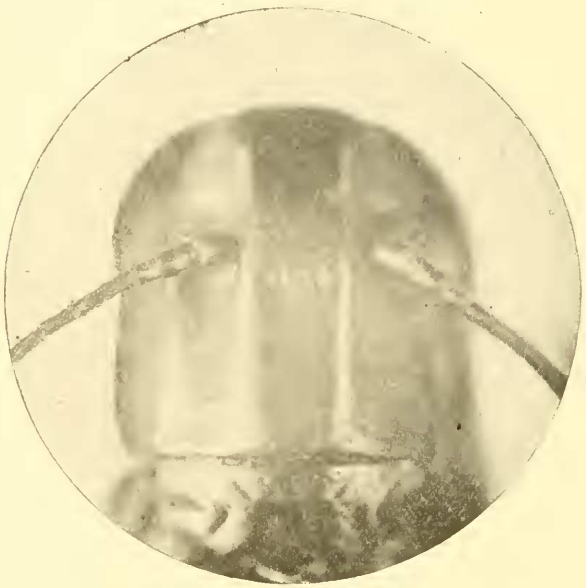

Fig. 1. Face view of *Melanoplus femur-rubrum* showing the supernumerary median ocellus.

placed in weakened solution of *eau de Labaraque* for twenty-four hours to soften the chitin. It was then dehydrated and embedded in paraffin in the usual way and serial sagittal sections ten micra thick were prepared. These sections were used as a basis for a reconstruction of the ocelli and ocellar nerve.

In the normal grasshopper as was shown many years ago by the beautiful dissections and drawings of Burgess,[2] the nerve to the median ocellus in *M. femur-rubrum* arises independently as

[2]Burgess, E. In the article "The brain of the Locust" by A. S. Packard. 2d rept. U. S. Entom. Com. 1880.

a single strand from the central brain mass in the median line and passes directly to the ocellus without branching. The writer was interested to know whether in this abnormal case the nerve supply would take the form of two entirely separate nerves or would arise as a single nerve and later branch. A graphic reconstruction made by the well known method is shown in Fig. 2. The nerve arises as a single one just as in the normal head and is divided only in the last third of its course. As would be expected from the distance between the ocellar lenses as seen in Fig. 1, there is a complete division of the nerve termination, the two retinal cups being entirely separate.

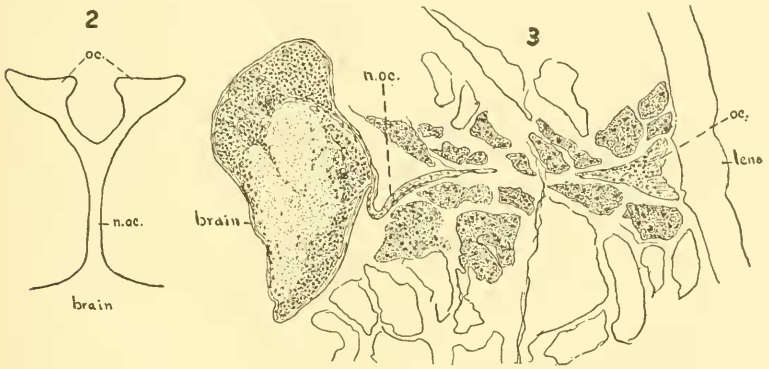

Fig. 2. Graphic reconstruction of the median ocellar nerve, showing its origin as a single strand and its later bifurcation. X 50.

Fig. 3. Sketch of a portion of a median sagittal section of the head, showing the origin of the nerve from the brain, and the ocellar cup and lens. The fixation is such as to be of value only in showing the general relations. X 50.

The entire length of the undivided portion of the nerve is not shown in Fig. 2 on account of a looping (apparent in Fig. 3) just after its exit from the brain. This would of course result in a considerable fore-shortening in a graphic reconstruction. Fig. 3 represents a sketch of a portion of a median sagittal section of the head showing the proximal half of the ocellar nerve and also a section of the ocelli. The histological fixation, due to the fact that the material was preserved with a large number of other specimens for ordinary dissecting purposes and perhaps was later wholly or partially dried, is not such as to show finer details either in brain,

nerve, or ocellus but is sufficiently good to show the relations of the various parts.

It would appear to be true that in the grasshopper the nerve of the median ocellus is primarily a single nerve bundle. In other insects, notably Hymenoptera, it has been shown that the nerve supply of the single median ocellus arises as two strands which later fuse,[3] (Viallanes,[4] Janet) and ends in the single sensory cup. In such cases each half of the median ocellar nerve arises as a branch of the nerve of the lateral ocellus of the corresponding side. In *Bombus*, where in an immature stage the median ocellus is elongated laterally or even slightly constricted to form a lobate ocellus, it is likely that at that period the two nerve branches supplying it are practically distinct throughout.

The question arises whether the occurrence of two median ocelli should be considered as a reversion to some ancestral type, or should be looked upon as a variation having other significance. The fact that a tendency to a doubling of the ocellus is apparent in the pupal stage of Hymenoptera but later disappears in the adult might lend support to the former view. However, as, so far as is known to the writer, no normal examples of a double median ocellus occur in lower insects, it would seem that the case in *Bombus* should be explained in some other way—possibly as merely the mechanical result due to the double origin of the nerve and the crowded condition of the organs of the head in bees.

In the case of the abnormal doubling of the ocellus in the grasshopper it would seem to the writer that the explanation probably lies in some unusual influencing factor during its embryological period.

The Second International Congress of Entomology.

Since the preliminary notice which appeared in Psyche for February, the date of meeting for the congress at Oxford has been changed.

The meetings will extend from the fifth to the tenth of August, 1912, and a large and distinguished attendance is expected.

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[3] Viallanes, H. Le Cerveau de la Guêpe (*Vespa crabro et vulgaris*) Ann. Soc. Nat. Zool. 1887 7e Ser. II, pp. 5–100, 6 pl.

Janet, Chas. Anatomie de la Tête du *Lasius niger*, Limoges, 1905.